


ADMINISTRATIVE INTERNAL USE ONLY

DD/A Registry
78-1354

28 MAR 1978

MEMORANDUM FOR: Deputy Director for Administration  
Director of Finance  
Director of Data Processing

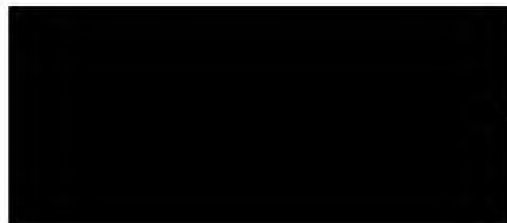
THROUGH : Inspector General

STATINTL FROM :   
Chief, Audit Staff

SUBJECT : Report of Audit Appraisal of  
the General Accounting System  
30 November 1977

1. The report of audit appraisal of the General Accounting System (GAS) as of 30 November 1977 is attached for your review. Please advise us of action taken on the recommendations contained in the report.

2. We wish to express our appreciation for the cooperation and assistance afforded the auditors by all personnel involved in the development of the GAS.



NTL

Attachment:  
As stated

Distribution:

- ✓ Orig. - DDA
- 1 - D/Fin
- 1 - D/ODP
- 1 - O/Compt/DCI
- 1 - IG

ADMINISTRATIVE INTERNAL USE ONLY

~~ADMINISTRATIVE - INTERNAL USE ONLY~~REPORT OF AUDIT APPRAISAL  
General Accounting System

30 November 1977

BACKGROUND

1. The General Accounting System (GAS) is a computer application used by the Office of Finance (OF) to maintain the official records of the financial operations of the Agency. It is designed to automatically perform many of the tasks required to produce the general ledgers, financial reports, data for budgetary control, and other information needed for fiscal management. The system, developed jointly by the OF and the Office of Data Processing (ODP), became operational on 1 October 1976 and replaces an outdated application in use since the early nineteen sixties.

2. The effort officially began in February 1974, even though preliminary work prior to then was done by the OF. The feasibility study and the project proposal were completed in May and November of 1974, respectively. Total development time was thus about three years.

3. There is no central record of all system development costs. We summarized the approximate costs from information obtained from the OF and ODP for the pre-implementation period, as follows:

<u>Category</u>	<u>Amount</u>
Office of Finance Labor - 26.5 man years.....	\$530,000
Office of Data Processing Labor.....	600,000
Office of Data Processing computer time and hardware.....	<u>1,400,000</u>
Total to 1 October 1976.....	<u>\$2,530,000</u>

4. Costs for continuing system enhancements since implementation are not included in the above figures. A comparison of planned versus actual costs is interesting, since it was originally stated that the project could be completed in six to eight months for approximately \$300,000\*. This comparison is discussed further in paragraph 14.

\*The original estimate included only the costs of the ODP.

~~ADMINISTRATIVE - INTERNAL USE ONLY~~

ADMINISTRATIVE - INTERNAL USE ONLY

-2-

5. The previous accounting system was inadequate. It lacked flexibility, adequate controls, and other desirable qualities needed to provide modern financial support. For this reason, the project proposal included specifications for important new system features to correct the prior weaknesses. The most outstanding features were specified to:

- provide computerized data transfer (interface)\*\* with the:
  - Agency Payroll Systems
  - Contract Information System (CONIF III)
  - Inventory Control System (ICS)
  - Financial Resources System - Budget Control (FRS)
- reject invalid data by the use of edit and validation routines
- post financial accounts daily to provide more current information
- provide regularly scheduled reports on a more timely basis
- satisfy requests for ad hoc reports in 4 - 24 hours
- input single line transactions with codes to automatically trigger the multiple postings to financial accounts
- utilize modern data base concepts to capture and hold, from input of obligations, data for subsequent use in related transactions
- provide a query capability of obligation and other data
- facilitate changes to programs through the use of special programming techniques

\*\*See attachment for a diagram of the Agency's Financial System.

ADMINISTRATIVE - INTERNAL USE ONLY

-3-

- automate the financial closing entries to save considerable manual effort
- break the constraints of the normal eighty character limitation for input by the use of modern data entry systems, and
- provide data entry points at key locations.

These together with other good features, too numerous to mention, were successfully incorporated and they contribute to a system vastly superior to the former.

6. Our participation in the project began in late 1974 and has continued until recently. The audit included an examination of plans and other material pertinent to the system and tests to verify satisfactory results. The audit concentrated on:

- test and evaluation of controls programmed to assure adequate data accuracy
- test and evaluation of manual procedures to verify the existence of adequate manual controls
- evaluation of the plan to test the system and participation in the test
- participation in the conversion process and an evaluation of the results of conversion
- review and evaluation of the results of operations to verify that they were acceptable, and
- review of system documentation.

7. In addition, we took specialized training in the relevant programming languages and system design. We also used audit retrieval programs to extract data for verification. The progress of the system will continue to be followed and reports issued if conditions warrant.

**ADMINISTRATIVE - INTERNAL USE ONLY**

- 4 -

SUMMARY COMMENTS

8. We have concluded that the GAS is sound. Controls and procedures are effective for production of reliable results. Some problems remain, but they will be solved by the completion of improvements now underway or planned and the resolution of remaining errors.

9. Since system implementation, the OF has requested many improvements, not only to eliminate problems, but also to incorporate original requirements that were postponed until after implementation. These include automation of annual closing entries, improvement of controls between files to assure agreement of data, and about forty other items at 30 September 1977. Many of the tasks have been completed, but new requirements are continually being added. However, these modifications, improvements, and maintenance tasks are normal for all systems.

10. A matter deserving mention concerns some GAS data not in agreement with related data in the FRS and elsewhere in the GAS itself. Though annoying and persistent, these discrepancies are by now not serious nor do they seriously affect confidence in the system. Progress is being made to resolve the differences and their causes. These discrepancies are discussed further in paragraphs 30 through 32.

11. To avoid delay of the project, the provision for history query of general ledger data was postponed until after system implementation. As an interim query capability for expenditures we provided the OF with several of our audit data retrieval programs. We also provided an automated capability for reconciling expenditures between the GAS and the FRS. The OF itself programmed a history query capability for obligations. The job to provide the balance of the query requirements for general ledger will soon be completed by the ODP.

12. This report does not offer recommendations in areas where satisfactory action is already initiated by either the OF or the ODP. The long list of pending enhancements and maintenance tasks properly addresses those areas needing attention. Management is apprised of these tasks by reports, meetings, and other means.

13. When possible, our recommendations for GAS improvements, such as controls needed, were given during our participation and included in the system or otherwise satisfactorily

**ADMINISTRATIVE - INTERNAL USE ONLY**

~~ADMINISTRATIVE - INTERNAL USE ONLY~~

- 5 -

resolved. This report comments on matters outside the system when relevant to the area being audited. Some comments are intended to highlight areas needing attention in other and future projects. Many matters discussed were beyond the control of individuals concerned and we have the advantage of hindsight. The task was difficult, and it was the imagination of all that provided the answers to the many problems encountered. The complex nature of system development is such that often more time is needed than originally envisioned and costs tend to grow. The recommendations resulting from this review are summarized below and detailed in the paragraphs indicated.

Office of Data Processing

- Review and revise the procedures for project proposals to increase their accuracy. Consider inclusion of all costs in the proposals and elicitation of more complete initial specifications from users. Obtain concurrence of all Directorates in revised procedures (paragraphs 14 through 18).

Deputy Director for Administration

- Provide policy and guidance for user offices to improve or acquire the skills necessary to participate with the ODP in the development and maintenance of computer systems (paragraphs 19 through 21).

Office of Finance

- Include financial activity for lapsed appropriations in either the GAS or the FRS (paragraphs 22 and 23).
- Request edits to prevent charging wrong accounts with property procurement transactions (paragraphs 24 through 26).
- Review certain account 4221 property procurement expenditures to determine their propriety and consistency with Headquarters property procedures. Make changes deemed necessary in the procedure used to compute the accounts payable figure shown on the Agency's financial statements (paragraphs 27 through 29).

~~ADMINISTRATIVE - INTERNAL USE ONLY~~

**ADMINISTRATIVE - INTERNAL USE ONLY**

-6-

DETAILED COMMENTS

Estimates for the System's Development

14. As mentioned previously, the ODP's initial estimates of project duration and total costs were not achieved by a wide margin. Agency management deserves more accurate information about computer related activities. The causes of these underestimates are usually many, often unclear, and difficult to rectify. Exceeding estimates is often the case in large projects, but unacceptable as the norm. Our observations indicate reasons for the GAS underestimates, and some possibilities are suggested to reduce recurrence in future efforts.

15. We believe that the estimates resulted from ODP's reliance on incomplete user specifications, unfamiliarity with development of general ledger systems, and inadequate OF participation in the forecasting process. Also, we were told of management pressures for timely results which we believe may have influenced the estimates. For example, the guideline at the time was to finish projects within a year of initiation, and other more subtle pressures. Consequently, the project proposal significantly underestimated the time and expense required to finish the job. On the other hand, the actual time and expense incurred does not appear to be excessive.

16. When the project proposal was written, some of the major areas needing further specifications were:

- the final general ledger design, including the needed data elements and the number of ledgers involved in the system
- the transaction codes required, including identification of the data elements for concurrent input and the elements resident in the system
- the system's interface requirements
- the system's input requirements, including forms design, identification of related data elements and their formats
- the edits and validations needed, including the criteria for rejection of data, the text of error messages, and the location of the programming logic, and
- the requirements for the conversion of the old system's data to the new system.

**ADMINISTRATIVE - INTERNAL USE ONLY**

- 7 -

17. The OF and the ODP were aware that significant specifications were unformulated. Apparently the ODP misjudged the implication of this. The ODP has procedures for estimating developmental efforts, but they rely heavily on the experience and judgment of the project leaders. Astute observations are necessary for estimating, given the divergent disciplines and complexities involved. For example, we learned that the OF believed that these systems require substantially longer to implement than was estimated. Presumably, this had no impact because the information was not solicited nor volunteered, and the proposal was accepted. Meaningful estimates are impossible when essential information bearing on the problem are unacknowledged. Apparently closer relationships are needed between the ODP and users during estimating to improve the judgments made. Also, the estimates only include the costs related to the ODP's responsibilities and exclude the user offices' costs. More meaningful estimates should include all costs projected for a system's development.

18. Management need not accept continual, major slippages as normal occurrences of systems development. Improvement of the estimating process should be an important Agency objective. Estimating will be facilitated if it can be supported by more complete specifications, increased judgmental input from users, and freed from other pressures. To define and require more complete specifications is difficult, but it should be feasible without being unresponsive to users. User management should view such steps as necessary to improve the developmental process and avoid misperceptions of unresponsiveness by the ODP. However, users must improve their computer related skills before closer relationships are fully practicable. The need for improved user skills is discussed in subsequent paragraphs.

#### Recommendation for the ODP

Review and revise the estimating process to increase its accuracy. The review should consider inclusion of all costs in the estimates and elicitation of more complete initial specifications from users. Concurrence in the revised procedures should be obtained from all Directorates.

ADMINISTRATIVE INTERNAL USE ONLY

-8-

### Computer Related Skills

19. User offices need to further improve their computer related skills and participate in greater depth with the ODP during systems development and maintenance. The OF has approached this through training and organizing a staff for computer development activities. Based on our observations, the OF representatives for the GAS project were better prepared than most users in the DDA and a highpoint in the cooperation with the ODP resulted. The specifications, nevertheless, needed improvement.

20. We have observed similar needs for improved specifications in other projects. The problem concerns improving communication of needs to the ODP. Users best know the end results to be achieved, however, communicating their requirements to the data processing specialists requires a higher level of basic technical computer knowledge than most users currently possess. Increased skills in systems analysis on the part of users can do much to solve the problem. Too much development of detail specifications is currently expected from the ODP's analysts. More accurate written requirements from users would improve this situation, facilitate project estimates, and reduce slippages. Increased efficiency in systems development should result.

21. Various offices are enhancing their computer related skills, but the effort is not uniform and does not receive the emphasis it deserves. Formal establishment of offices' objectives for skills improvement could provide the impetus needed. Recruitment policies could stress the importance of hiring individuals with existing computer related skills. As the OF has done, major user offices should consider establishing staffs that concentrate on computer activities. We believe a strong effort by DDA management, the ODP, and major user offices should be made to develop or strengthen computer skills in major user offices. This would go a long way toward providing more efficient and effective use of computer assets in the Directorate.

### Recommendation for the DDA

Provide policy and guidance for the development or strengthening of the capability within each major user office to participate with the ODP in the development and maintenance of computer systems. The steps necessary to accomplish this may require a change in the current recruitment, personnel management, staffing, and training policies within the DDA.

ADMINISTRATIVE INTERNAL USE ONLY

~~ADMINISTRATIVE~~ ~~INTERNAL USE ONLY~~

- 9 -

Lapsed Appropriations  
Financial Reporting

22. The Agency's financial system excludes data needed for reporting on offices' lapsed appropriations (M Year) financial activity. These data were reported at the office level from the prior accounting system. The need for this information results from the Comptroller's decision to revise the prior procedure and report allotment and related data from the GAS only as directorate totals. Subsequent adjustments to the FRS to accommodate offices' needs for prior years' information apparently overlooked M Year, since other years' data are included and reported.

23. Unreported information includes offices' accumulated financial activity, the resulting status of sub-allotments, and other relevant data. Such information is needed by offices to control allotments and review accumulated data pertinent to their activities. Of course, GAS reports provide similar information as directorate totals. The exclusion of M Year data at the office level is contrary to controls accorded other years' allotments. The addition of M Year data will strengthen financial controls.

Recommendation for the Office of Finance

Provide for inclusion of financial activity for lapsed appropriations within the Agency's financial system. This can be accomplished in either the GAS or the FRS.

Procurement Expenditures  
Incorrectly Charged

24. During our post implementation review we found significant amounts of property procurement expenses charged to wrong accounts. The errors result from use of incorrect transaction codes and lack of edits to reject such input. A need for these edits was overlooked during system development.

25. Specifically, the errors involve recording property procurement expenditures in a non-procurement expense account, the 4221, rather than in the correct procurement expense account, the 4223, as indicated by the office codes (88 or 98) accompanying the transactions. (Expenditures with codes 88 or 98 are account 4223 charges, whereas other codes are 4221 charges.) An edit in GAS would have rejected these errors. Conversely, additional errors involve recording property procurement expenditures in the procurement expense account, the 4223, rather

~~ADMINISTRATIVE~~ ~~INTERNAL USE ONLY~~

-10-

than in the non-procurement expense account, the 4221, as indicated by the office codes (not 88 or 98) accompanying these transactions. A second type of edit in GAS would have rejected these errors.

26. After discussions the OF began correcting the errors, which are easily found with the new query capability. Additional edits can prevent repetition of this situation and they should be incorporated into appropriate routines as soon as practicable.

Recommendation for the Office of Finance

Request edits to prevent charging wrong accounts with property procurement transactions.

Results of Incorrect Procurement Charges

27. The practice of charging certain property procurement expenditures to account 4221 for offices other than 88 or 98 needs review. This refers to intentional, correctly coded charges and not the previously described errors. Since the audit was primarily limited to system examination, we did not explore the possibility that procurement expenditures in account 4221 may include material subject to Headquarters property procedures - the Material Procurement Allotment/Property Requisitioning Authority process (MPA/PRA). The account 4221 reflects millions of dollars of Headquarters originated, non cash procurements charged from the Agency's funds outside the MPA/PRA process.

28. The effect on the accounting system from such charges and from the errors discussed previously is important. Both conditions may result in misstatement of accounts payable shown on the Agency's financial statement; the value of account 4223, not 4221, has been used in the formula computing the payable figure. The upshot is that the Agency's capital position (equity) could be wrong to the extent of inconsistencies in the accounts.

29. There appears to be little need, under current property procedures, to charge the Agency's funds to account 4221 for Headquarters originated, non cash procurements. Even if consistently budgeted, the treatment given these charges appears inconsistent with that given similar charges in the account 4223. In any case, this situation requires further exploration. The OF should resolve the propriety of this apparently dissimilar treatment of similar activities and its resulting effect on the Agency's published financial position.

-11-

Recommendation for the Office of Finance

(a) Review the practice of charging certain property procurement expenditures to account 4221 to determine its propriety and also its consistency with Headquarters property procedures and (b) make changes deemed necessary in the procedure used to compute the accounts payable figure shown on the Agency's financial statements.

Agency Financial System Discrepancies

30. Some differences still exist in related data between the GAS and the FRS and within the GAS itself. Corrective efforts have significantly reduced the originally large and numerous discrepancies. Most related data are now in agreement, the remaining errors are known, and corrective action is continuing. The current differences will not effect a breakdown or a loss of confidence in the system.

31. For example, at 30 November 1977 the following differences exist between the GAS account 4221 expense subsidiary and the related expenditures in the FRS:

<u>Number of Offices Effected</u>	<u>Fiscal Years Effected</u>	<u>Number of Differences</u>	<u>Net Total</u>
21	all	28	\$64,697

These discrepancies include both positive and negative amounts and range from plus \$63,962 to minus \$42,376.

32. The various differences result from programming, conversion and other errors. Corrective action is not completed because of the limited human resources available to work on the many competing job priorities. Both the OF and the ODP should continue their efforts in this area.

Recommendation for the OF and the ODP

Continue efforts to resolve existing systems differences and their causes.

THE AGENCY FINANCIAL SYSTEM

